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SCIENCE NEWS LETTER

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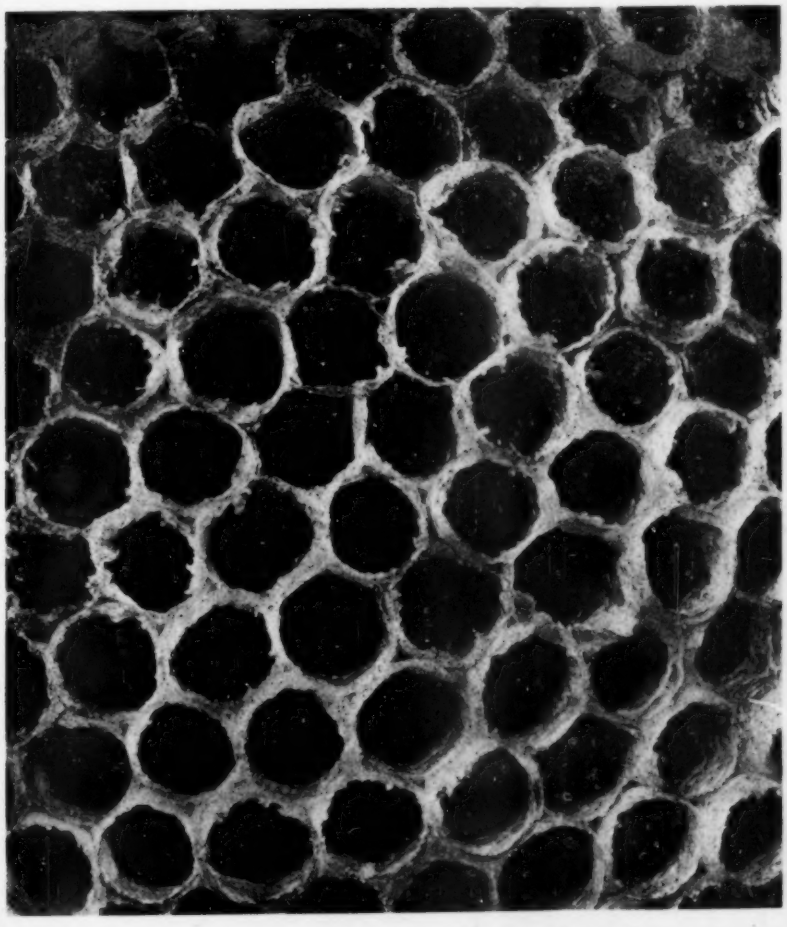

JULY 27, 1935

Physics, Not Architecture

See Page 57

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VOL. XXVIII *No. 746*

The Weekly Summary of Current Science

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DO YOU KNOW?

France has a new cancer institute, in a suburb of Paris.

Regulation golf balls have less resiliency in cold weather.

Primitive peoples have no system of dividing the day into hours.

The wandering albatross is the largest of all flying birds, says the Field Museum.

The United States has the world's largest laboratory devoted entirely to study of uses of wood, known as the Forest Products Laboratory.

Caring for mental patients in private families, rather than institutions, is being tried in this country, following success in Belgium and France.

Russian aviators report success in towing one airplane with another, suggesting the practical application that a damaged plane landed far from its hangar can be towed back to base, instead of sending mechanics to the scene.

Skeletons of mud puppies, preserved in what were once water pools some 400,000,000 years ago, are similar in many traits to common mud puppies of today.

Artists who paint billowy, fair-weather clouds with rounded bases are nature-faking, says one meteorologist; such clouds have flat bases, and all on one level.

Investigations show that trout fry planted in streams dwindle, not so much because large fish-eating birds catch them, as because other fish gobble them up.

"Immunity to ivy poison is an uncertain thing at best, for individuals lose their immunity without apparent cause," writes Prof. G. Albert Hill, of Wesleyan University in *American Forests*.

British physicians warn that a liquid poison should never be kept in an ordinary bottle, as it often is, but only in the bottle in which it was bought, properly labeled.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

ARCHAEOLOGY

How did the Mayas ornament statues of their gods? p. 62.

How old is art in America? p. 54.

Where was man civilized as far back as 5,000 B.C. in the New Stone Age? p. 56.

ASTRONOMY

When do the Perseid meteors appear? p. 58.

BACTERIOLOGY

Can a room be illuminated by luminous bacteria? p. 56.

CHEMISTRY

Why is synthetic gasoline especially important to Italy? p. 53.

ENGINEERING

What limits the usefulness of an automatic device for measuring car speeds? p. 51.

What use has the bolometer? p. 54.

ENTOMOLOGY

What shape is the cell of a honeycomb? p. 57.

What sort of flying squadrons have been enlisted in the battle against bollworm? p. 56.

EVOLUTION

How large do the Galapagos tortoises grow? p. 63.

MEDICINE

How does the surgery of the Brazilian Indian medicine man resemble that of the white man? p. 57.

How is hay fever linked with the common cold? p. 57.

What drug has been found useful against a disease of muscle weakness? p. 52.

What happens when baby does not get his orange or tomato juice? p. 55.

What is it in the skin that causes some to "splotch" instead of tanning in the sun? p. 55.

What new cure is reported for boils? p. 61.

ORNITHOLOGY

How did scientists contrive to record the song of a bird that sings only near water falls? p. 52.

PALEONTOLOGY

How large did trilobites grow? p. 55.

PHYSICS

How great is the highest energy ever found in gamma radiation? p. 51.

PHYSIOLOGY

How is the endocrinologist aiding the dairyman? p. 57.

Why is the term "vitamin" disapproved by a Montreal scientist? p. 61.

PSYCHIATRY

At what age are persons most likely to develop mental disease? p. 53.

PSYCHOLOGY

Is there a scientific type of mind? p. 60.

SEISMOLOGY

How can the electric eye "see" earthquakes? p. 56.

SPECTROSCOPY

What is the principal obstacle to the understanding of the structure of hemoglobin? p. 54.

ZOOLOGY

What creatures of our western states are being destroyed by dust and flood? p. 63.

PHYSICS

Man-Made Gamma Rays Six Times As Piercing As Nature's

Presence of Radiation of 16,000,000 Electron Volts Detected Definitely By Study of Atomic "Debris"

MAN-CREATED gamma radiation, of the kind so widely used in the treatment of cancer, and excelling the best efforts of nature over six times, is being studied at California Institute of Technology.

Four scientists, headed by Prof. C. C. Lauritsen, of the Kellogg Radiation Laboratory, report in the *Physical Review* (July 15) that they have unmistakable evidence of laboratory-produced gamma rays having energies of 16,000,000 electron volts. The highest energy found in natural gamma rays—given off by radioactive substances such as radium—is only 2,600,000 electron volts, an energy "record" held by the radioactive element known as thorium C."

Prof. Lauritsen's 16,000,000 electron volt gamma rays were obtained in experiments performed in collaboration with Dr. H. R. Crane, Dr. L. A. Delsasso and W. A. Fowler. The light metal element lithium was bombarded with protons, the positively-charged nuclei of hydrogen atoms, to yield the piercing rays.

The proton atomic "bullets" were driven down a special vacuum tube, in the research, by electric voltages which ranged from 400,000 to a million volts. On striking the lithium target, the proton is believed to combine momentarily with lithium atoms.

The lithium atoms, the investigators report, are thought to be the isotopic form of mass seven. When a proton joins them, it adds its mass of one so that the total mass is eight.

The 16,000,000 electron volt gamma rays which emanate from the union are best explained by assuming that the lithium and proton of total mass eight break up into two helium particles, each of mass four. Such helium nuclei are known as alpha particles and, along with gamma rays and electrons, are given off when radium disintegrates.

To balance the queer-looking energy equation, it is necessary to postulate that 17,000,000 electron volt gamma rays come out when the two alpha particles are created.

The presence of 16,000,000 electron volt rays was detected quite definitely by a study of the atomic "debris" knocked out.

Tracks of the flying electrons from the impacted atoms of the lithium target were observed in a Wilson cloud chamber in the investigation of the high energy gamma radiation.

Science News Letter, July 27, 1935

CHECKING UP

With this device, the motorist's speed can be determined without the expedient of having a policeman give chase and clock him. The time taken for the car to travel the distance between two beams of light is measured and may be read in terms of miles per hour.

ENGINEERING

Electrical Device Aids in Measuring Speeds of Cars

THE UNIVERSAL protest of motorists caught speeding, "But officer, I was only doing twenty-five," may soon be a thing of the past. A new portable electrical device, measuring the instantaneous speed of an automobile and lessening the chances of error on the part of traffic officers, has been perfected by Dr. Harry R. DeSilva, head of Massachusetts State College's psychology laboratory.

Two concentrated beams of light are thrown across a road by 50-candle-power lamps operated from an auto storage battery. These activate two photoelectric cells in the indicating instrument. An automobile passing across the light beams, which are only 18 inches apart, cuts off first one light beam, charging a condenser in the recording apparatus, and then a fraction of a second later, cuts the second beam, stopping the charging process. The amount of "charge" in the condenser is translated directly by the instrument into miles per hour. Accuracy within 2 miles per hour at 60 miles auto speed and within a fraction of a mile at 30 is claimed.

By pressing a button, the instrument can be made ready for another speeder. Accuracy is not the only virtue of the device, for it can be carried about in the rear of a car and set up at will to measure speeds on curves, intersections, and places to which other measuring devices are not easily adapted.

Dr. DeSilva plans several additions to his original device. One is the installation of a camera photographing the license number of the car going through the "trap," and the speed dial reading simultaneously.

Whether any such device as this could be used as legal evidence in many states, is problematical. Some state speed laws require proof that a driver has violated the speed regulation over a stretch of road, such as one-half mile, rather than at some

specific instant before he can be arrested.

Other states, such as Michigan, have no speed limit, the law providing that how well a person drives under certain circumstances, not how fast, is the test of legal driving. The possibilities of inaccuracy due to mechanical failure or tampering would probably prevent its use as evidence, just as the "lie detector" is barred in murder trials.

The main use of such a device will probably be in studies and surveys of average speeds on highways, curves and at intersections, to provide a much needed statistical background for more sensible speed laws.

Science News Letter, July 27, 1935

MEDICINE

Find New Way to Attack Disease of Muscle Weakness

A NEW attack has been launched in the fight against the strange disease of muscle weakness known as "myasthenia gravis."

This distressing and usually fatal, but fortunately rare, illness comes on gradually. The first symptom is usually general tiredness. This may be followed by trouble in walking or in lifting the arms or in grasping things. In a later stage the facial muscles often become so weak that the jaw cannot be kept shut or the eyes properly open.

Various physicians in London have lately been giving special attention to the search for an adequate remedy for the disease, and not long ago a possible way for checking it with complex chemicals called eserine or prostigmin was reported.

Eserine is believed to act by delaying the abnormally high rate of destruction, in myasthenic patients, of acetylcholine—the chemical "transmitter" which forms the link between a muscle and the nerve-ending which should control it. Another way of achieving the same result would be to stimulate the production or, at any rate, the utilization of the acetylcholine.

This latter method has now been tried by Drs. L. P. E. Laurent and W. W. Walther, who report their results in *The Lancet*. (June 22).

Had Worked With Cats

It was known that similar stimulation could be produced in cats by means of potassium chloride, and the London physicians decided to try this substance for the human sufferers from myasthenia. The temporary results from this treatment were striking. Strengthening of the facial muscles was particularly marked, the appearance of a patient frequently changing remarkably from the wasting look of starvation to relative vitality in less than an hour after administration of the drug.

Six patients have received the potassium chloride daily for a period of two months, six doses being given daily. The treatment is stated to have proved valuable in conjunction with prostigmin. Several of the patients have found that a dose of potassium chloride, taken before the action of the prostigmin has ended, relieves the trying exhaustion which often followed the earlier treatment.

Many more experiments will have to be made, however, before any finality can be reached in the relief of the illness.

Science News Letter, July 27, 1935

ORNITHOLOGY

Sound Recording Methods Preserve Bird Calls

THE JOINT expedition of Cornell University and the American Museum of Natural History of New York City, which has just returned from recording the calls of almost extinct species of birds for posterity, had its amusing as well as its difficult experiences.

In the ten miles of film record and sound recording brought back by the expedition's director, Prof. A. A. Allen of Cornell, are the calls of the rare Ivory-billed Woodpecker, the Limpkin, the Sandhill Crane, the Wild Turkey, the Bald Eagle, the Golden Eagle, the Prairie Falcon and the Trumpeter Swan.

In Florida a Carolina Wren insisted on building its nest in the sound truck while the scientists were trying to record its voice. In Colorado a Golden Eagle tried to swallow the microphone which had been lowered 700 feet over a cliff to reach the ledge on which the eagle's nest was built. In Florida, again, a mocking-bird recognized the sounds of a rival when one of the films was being tested. It dashed at the window of the room trying to drive the rival away.

In recording the bird records, which eventually may be transferred to phonograph records and distributed through the schools of the nation, the expedition met its technical difficulties.

How, for example, would you record the sound of the rare Water Ouzel, which lives only near water falls? Dr. Allen's party solved the problem by getting the microphone within two inches of the bird's beak so that the sound was much louder than the crash of water in the background. How long it took them to achieve this feat is not revealed.

Then, too, it was no easy task to record the "dance" of the bird known as the Lesser Prairie Chicken, but patience finally yielded the sound, caused by the patter of the bird's feet on the ground with extraneous sounds muffled as background noise.

Freak weather followed the expedition's entire journey. There was frost in Florida, dust-storms in Oklahoma, cloud-bursts in Colorado, July snow storms in Montana, and to cap it all, when Prof. Allen was safely home in Ithaca, along came the recent New York flood, which swept around his home and carried off his outdoor runs and captive birds.

Science News Letter, July 27, 1935

FOSSIL TREE'S STRUCTURE

How the microscope viewed the wood of the petrified tree shown on the opposite page. A tangential section.

A crossed-eye, if not given competent medical attention, may decrease in seeing power through non-use, while the good eye is overworked.

Cornell scientists are studying the production of onions, in the hope that New York State may grow mild varieties such as those from Italy and Bermuda.

CHEMISTRY

Italy's Chemists Gave Her Weapons for War in 1934

Permits Issued for 118 New Chemical Plants; Problems of Dyes, Fuels, Medicines, Were Studied

THAT Italy's mind was occupied with the possibility of future war in 1934 is indicated, according to well-informed observers, by the great strides her chemical industry took that year. When Mussolini finally decides to put on the gloves with Abyssinia, his country will find nothing neglected in the way of laboratory preparation. Synthetic gasoline is only one of the weapons his chemists have given his army.

A report just issued by the Chemical Division of the Bureau of Foreign and Domestic Commerce details this chemical progress. It shows that Italy has joined the race to prepare more quickly and efficiently in the laboratory what Nature does out-doors. Nor have Italian chemists been concerned chiefly with such melodramatic contributions as the supposed chemical which will be sprayed upon the ground where Ethiopians march and thus burn their bare feet.

Italy in 1934, the report states, issued permits for the erection of 118 new chemical plants during 1934, bringing the total number to 874 at the end of the year, with an aggregate capitalization of 2,426,500,000 lire. Her foreign trade in chemicals followed the course taken by her general trade. She imported heavily and allowed her exports to drop.

During the year the Montecatini Chemical Company, Italy's largest, constructed two huge research laboratories, on a scale hitherto unknown in that nation. The company reported that important advances were made in the production of synthetic dyes and medicines, methanol, formaldehyde, synthetic resins, artificial cryolite and synthetic camphor.

The company claimed to have produced a satisfactory synthetic gasoline from domestic lignite—a big boon to petroleum-lacking Italy—and an important new explosive derived from methanol and nitric acid. It is also reported to have solved the problem of producing a domestic cellulose suitable for nitration and the rayon industry—a big help to timberless Italy. And as far as cellulose for the manufacture of paper is concerned, Mussolini's chemists have found it in rice and wheat straw.

Other chemists attacked the problem of gasoline from another angle. They have not found a new way of preparing it. They have eliminated its use. They have met the possibility of a future national emergency by studying the production of sugar-beet alcohol for motor fuel.

On another front of the laboratory race to outdo Nature, scientists reported new progress in the separation of gases from natural steam geysers. In addition to getting carbon dioxide, they obtained valuable quantities of hydrogen, nitrogen, methane and helium—all highly strategic weapons for the war chemist.

Science News Letter, July 27, 1935

LOG 60,000,000 YEARS OLD

A log of petrified wood, dating back to somewhere around the time when the great coal beds were still tangled swamps, has been turned up in the Ozarks—a rare find for that region. Studies by Prof. J. E. Cribbs of Drury College disclosed some portions still uncrushed, showing microscopic details of structure quite clearly. It is regarded as probably a new species of fossil tree. The photograph is by Wm. J. Gibbs.

PSYCHIATRY

Mental Disorder Is Viewed As Disease Of Old Age

MENTAL disorder is primarily a disease of old age. It may be considered a result of the general lowering of vitality and the wearing out process which causes certain physical diseases of old age.

This new view of mental disease results from statistical research by Dr. Neil A. Dayton of the Massachusetts Department of Mental Diseases. Study of more than 61,000 admissions to New York and Massachusetts mental hospitals over several years shows that most of the cases of mental disease occur in older persons.

"In ages over 70 the admission rates are four times as high as those of middle age," Dr. Dayton stated.

"Mental disease," says Dr. Dayton, "is now placed squarely in line with failing physical processes. Mental disorder is quite removed from those diseases which are supposed to be due to the many strains imposed by our present civilization. In the younger and middle ages, when the stresses of life are most pronounced, the population does not present large proportions of mental disease.

"However, the older ages, accompanied by lesser degrees of business and social activities but with increased physical impairment and lower vitality, show admission rates for mental diseases which are the highest of all.

"Mental disease should not be accepted entirely as an abstract disorder of the

mind or the emotions. The condition is inextricably linked with failing physical processes, and may be considered in the same category with the degenerative diseases.

"If mental disease is purely a reaction on the part of the individual to certain social, environmental and emotional situations, why do we find the close linkage between mental disease and the general wearing out process which is encountered as the older ages are approached? Mental disease appears in increasing proportions when death begins to appear so conspicuously in the latter middle ages and the senium. This association suggests that the physical conditions which the brain and body need for the maintenance of sound mind disappear with the failure of the whole organism in vitality and valid function."

Science News Letter, July 27, 1935

ENGINEERING

New Instrument To Measure Light Intensity Developed

A NEW, simplified instrument for measuring precisely the intensity of light has been developed by Prof. Parry H. Moon, of the illuminating engineering department of Massachusetts Institute of Technology.

Known technically as an alternating current bolometer, Prof. Moon's instrument is so sensitive that it will measure the light from distant stars but will have its chief use in research on the various forms of lamps and lights in the field of illumination.

The bolometer is a small instrument looking exactly like the ordinary vacuum tube in a radio set. Inside the tube is a small piece of blackened metal known as the "target." When light falls on the target, its blackened surface absorbs some of the heat present in the rays. This heat change, while minutely small, is sufficient to vary the nature of the tiny alternating current flowing in the tube. Measurement of the change is made possible by an alternating-current amplifier, similar to those employed in radio sets which have been brought to a high state of technical perfection.

Prof. Moon's new bolometer overcomes some of the older handicaps encountered in working with research in light measurement. Its chief advantage is that it dispenses with high-sensitivity galvanometers demanding delicate laboratory technique.

In addition, older devices developed slight differences of temperature when two different kinds of metals were connected in the measuring circuit and false currents were set up. These false currents, like parasites, attached themselves to the true current being measured. This condition is not experienced with the new instrument.

The theory and design of the apparatus was worked out by Prof. Moon. W. R. Mills, Jr., student in his department, constructed the instrument.

Science News Letter, July 27, 1935

SPECTROSCOPY

Spectroscope Proves Aid In Study of Hemoglobin

EXCEPTIONAL progress toward a solution of science's old problem of the structure of hemoglobin was reported by Dr. David L. Drabkin of the University of Pennsylvania, who spoke at the Third Annual Conference on Spectroscopy meeting at the Massachusetts Institute of Technology.

Hemoglobin is that complex constituent of the blood which acts as a conveyor of life-giving oxygen to the various parts of the body.

Its importance, Dr. Drabkin said, is exceeded only by the difficulty of studying it. With the spectroscope, however, Dr. Drabkin has been able to conduct analyses far in advance of any carried on previously and although the problem is still unsolved, tremendous steps toward the ultimate solution have been made.

Spectroscopy is the investigation of matter by a study of the light it emits. It has proved a powerful and accurate method of research in various scientific fields.

Further proof of this was added by Dr. Drabkin when he described the comparative ease with which spectroscopy had enabled investigators to study vitamin B_1, the oldest known yet most elusive vitamin. The next step, he said, would be a method of studying the reflection spectra of tissues directly to replace the present method of studying biological substances in solution. This would be a great aid toward solving the hemoglobin problem, he said, since the very fact that it is now possible to work with it in solution only, is the main obstacle to a complete understanding of its mysteries.

Science News Letter, July 27, 1935

ARCHAEOLOGY

First Americans May Have Been "Redskins"

THE EARLIEST Americans may have been real "Redskins."

So it appears from discovery of the red paint—which later Indians spread and striped in patterns on their faces—among the camping effects of America's ancient "Folsom hunters," in Colorado.

Dr. Frank H. H. Roberts, Jr., of the Smithsonian Institution, who is now exploring more intensely the Folsom camp site he found last year, is not able to say conclusively yet how the red paint was used. It is, however, the same red, earthy hematite, or red chalk, which was widely used by Indians.

Dr. Roberts found several pieces of this red chalk at the camp ground. Each piece had smooth and worn surfaces from rubbing, indicating that they supplied red ochre for paint. A flat, slightly concave stone with traces of red clinging to it was also found, suggesting that this was an old paint dish.

What Did They Paint?

If Folsom hunters were like Indians of later times, they were partial to red, and used it not merely to make their faces fearful for war, or beautiful, but also to color animal skins, arrows, shields and tents. The hematite was powdered and mixed with grease or saliva to form paint.

Stone "gravers" found by Dr. Roberts are further evidence of Folsom Man's interest in art. This kind of tool was used by Indians to engrave designs in bone or other material, and, while none of Folsom Man's art products have yet come to light, the archaeologist believes that the engraving implements may foreshadow such discoveries. These implements had no other use, to archaeological knowledge.

Science News Letter, July 27, 1935

MEDICINE

Scurvy Returned to U. S. With the Depression Diets

President of American Academy of Pedriatics Sounds Warning to Colleagues of Diet Deficiency Disease

PHYSICIANS in this country thought scurvy was ancient history. It was so extraordinary for a baby to have it that medical students were shown the popeyes, bleeding gums, and tender legs of a tiny scurvy patient as something very rare in a doctor's experience.

There was rickets in the United States for baby specialists to cope with. But scurvy was a disease of malnutrition to read about in books.

"It is hard to be rudely awakened from so happy a dream," says Dr. Thomas B. Cooley, president of the American Academy of Pediatrics.

Sounding the warning of this returning "curse"—as nutritionists feelingly call it—Dr. Cooley has written as follows to the American Child Health Association:

"When some three years ago, we began to see that our annual case of scurvy at the Children's Hospital had grown to five or six cases severe enough to need hospitalization, we looked upon the increase as probably accidental and temporary. In this we were wrong, for as the depression deepened, we found that 'thick and fast they came at last, and more and more and more,' until we came to realize that we were seeing in a few weeks' time more scurvy than an ordinarily experienced pediatrist would have expected to encounter in a lifetime."

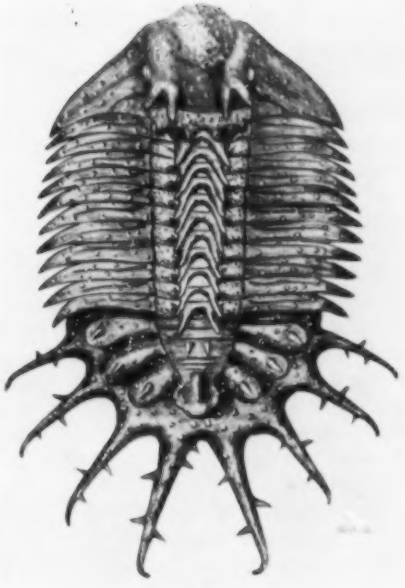
Dr. Cooley plainly calls scurvy a by-product of the depression. Its serious malnutrition symptoms come from lack of vitamin C. So many of the fruits and vegetables contain this vitamin that adults and children of school age are apt to get enough vitamin C to escape lasting damage. But if the baby's orange juice or tomato juice are crossed off the market list in hard times, and he goes too long on milk and water, the harm, says Dr. Cooley, "may well be irreparable."

"The baby's cocktail hour was supposed to be even more universally observed than that of the parents," Dr. Cooley comments, thinking of the prosperous era when every family seemed to be enlightened on baby feeding.

Now his own state, Michigan, is making a special health drive through its officials and child specialists, to put the deficiency diseases "back in their proper place."

The baby's needed ration of juice is small, but if the family cannot buy even the minimum in oranges or tomatoes, nutritionists can suggest other foods that will serve. Juice extracted from freshly ground or grated turnips, rutabaga, or cabbage compares favorably with tomato juice in the valuable vitamin C. And for the older preschool child there are many raw vegetables which may be chopped fine for suitable sandwich fillings of the protective vitamin.

Science News Letter, July 27, 1935



GIANT AMONG TRILOBITES

Restoration sketch of the largest trilobite ever found, a two-foot specimen, elaborately ornamented, discovered in a quarry near Buffalo.

PALEONTOLOGY

Giant Crab-like Fossil Found Near Buffalo

REMAINS of a 250 million year old giant crab-like creature, largest of its kind ever found, have been discovered in an abandoned quarry at Williamsville, near Buffalo.

More than two feet long, the creature once scuttled across the bottom of a shallow tropical sea that in Devonian times rolled over the present site of Buffalo. Scientists call it a trilobite, dignified with the name of Terataspis grandis. This particular kind has never previously been reported from western New York.

It is very ornate in structure, being decorated with a fringe of long, thorny spines around the tail piece while the head has on it a large wart-covered globe behind which is a second fringe of smooth spines. The head and the tail piece, with a few fragments of some of the body segments, were discovered by Irving G. Reiman, curator of geology at the Buffalo Museum of Science, while on a Sunday afternoon field trip.

Hundreds of geologists, amateur and professional alike, have searched the Williamsville quarry over a period of nearly a century, in an effort to unriddle the story told in its massive limestones. They have collected literally thousands of specimens including many small trilobites, none more than two inches long. But all overlooked this giant of the species, which was in plain view.

Science News Letter, July 27, 1935

MEDICINE

Spectroscope Is Used to Study Types of Sunburn

THE SPECTROSCOPE, instrument that analyzes the light of stars, chemicals and other industrially useful things, promises to tell why some skins sunburn with rashes and splotches and others just redden and tan.

To the Massachusetts Institute of Technology conference on spectroscopy, Dr. Harold F. Blum of the University of California explained the use of the spectroscope to study various kinds of sensitivity of human skin to light.

Normal skin is sensitive only to that light which ordinarily produces sunburn and then tanning, he said, but some skins possess some special pigments which respond to light with various rashes and splotching. By sorting sunlight with a spectroscope, he was able to filter it and determine the exact wave lengths which caused particular rashes. This may suggest possible cures, although no progress in this direction has been made as yet.

Science News Letter, July 27, 1935

ENTOMOLOGY

Wasps Brought From Egypt By Air-Conditioning

THREE flying squadrons of Egyptian wasps recently reached the United States in an air-cooled transport for service as shock-troops against the pink bollworm, a recent invader of North American cottonfields.

These tiny fighters from the banks of the Nile will be the principal offensive weapons used by the U. S. Department of Agriculture to destroy the advance guard of the pink bollworm, the most destructive cotton pest in the world, before it is able to prepare the way for a major invasion of the main Cotton Belt, as yet unpenetrated.

One type of the wasps, which comes from East Africa, was successfully colonized in Egyptian cotton fields, but was unable to withstand the long journey to the United States. Air-conditioning and refrigeration solved the problem, and the present batch reached the Department's insectary in high spirits and ready for a fight, according to C. P. Clausen, director of insect parasite introduction.

Before being turned loose against the bollworm, the wasps will be given time to increase in numbers and build up a formidable army. There have been a number of American-born recruits since the Egyptian detachment landed.

Science News Letter, July 27, 1935

SEISMOLOGY

"Electric Eye" Improves Recording of Earthquakes

A NEW way of making earthquakes write reports of their occurrence in distant parts of the world has been devised by Halley Wolfe of the California Institute of Technology. It combines the advantages of two former systems, and avoids disadvantages that handicap both of them.

Present types of earthquake records are made in two ways. In one an instrument with a heavy pendulum holds a delicate pen-point against a sheet of moving smoked paper, and makes wiggly lines when an earthquake occurs. The advantages of this method are its low cost and its constant visibility; its disadvantage lies in the lower sensitivity caused by the heavy weight.

In the other method a small mirror, mounted on a much lighter, more delicately balanced weight, causes a beam of light to dance back and forth on a sheet of photographic paper when the quake comes. This method has the disadvantages of requiring the use of expensive photographic paper. Furthermore, the only way in which the observer can tell whether a quake has occurred is to remove and develop the recording sheet.

In Mr. Wolfe's new device the mirror-directed beam of light is used, but the photographic paper is omitted. Instead, the beam plays on a photoelectric cell—the "electric eye" of physicists—which sets up a fluctuating current as the beam flickers across it. This electric current, suitably amplified through a vacuum tube hook-up, drives a specially constructed pen which records the waves on a moving sheet of plain white paper.

Mr. Wolfe's apparatus, set up at the seismological laboratory of the Carnegie Institution at Pasadena, has been in successful operation for over a year. Records made by it in ink on paper correspond in exact detail with records of the same earthquakes made by the direct photographic method.

Science News Letter, July 27, 1935

ARCHAEOLOGY

High Culture in Malta Of the New Stone Age

CIVILIZATION of a high order existed on the Mediterranean island of Malta, just south of Sicily, before the human race had learned the use of metals. Recent excavations by Prof. Luigi Ugolini of the University of Rome have disclosed a number of temple ruins, well built, each with several circular and elliptical ground plans, as well as a many-roomed dwelling house, all dating between 6000 and 5000 B.C.

The excellence of the stonemasonry, carved as it all was without the use of metal tools, as well as the good workmanship of the stone axes, knives and sickles, and of the pottery and terracotta images found in the ruins, argues a well-developed, well-ordered civilization that must have stood for many generations when the structures were put up, Prof. Ugolini feels.

To account for so high a civilization as far west as Malta, Prof. Ugolini advances a theory that runs counter to all previously accepted ideas of the origin and progress of civilization. Present theories hold that high cultures arose in the East and moved westward, but the Roman archaeologist believes now that the migration was in the other direction, civilization reaching a high point first in Malta—and possibly in Spain before that—and moving eastward to plant the seeds of the later high cultures of Crete and the Aegean coasts of Greece and Asia Minor.

Science News Letter, July 27, 1935

IN SCIE

ASTRONOMY-RADIO

Eclipse Veiled by Clouds Studied With the Radio

THE recent moon eclipse improved radio receiving conditions, according to the preliminary results of tests made by Dr. Harlan T. Stetson and T. S. McCaleb of Harvard's Institute of Geographical Exploration.

Continuing comparative tests for subsequent nights after the eclipse are expected to give support to Dr. Stetson's theory that the moonlight affects radio signal intensity.

"It was a novel sensation to observe an astronomical event through clouds by radio methods," Dr. Stetson said. In spite of clouds that obscured the moon visually, the observations of radio signals from Station WBBM, Chicago, were successful, showing improved conditions as the moon entered the earth's shadow.

Science News Letter, July 27, 1935

BACTERIOLOGY

Bacterial "Rockets" Feature Unique Exposition

"ROCKETS" of luminous bacteria, that shine with cold light of their own making, featured a unique bio-luminescent exposition held in Vienna recently, under the direction of the widely known Viennese biologist, Prof. Hans Molisch.

The "rockets" were set off in spiral glass tubes filled with a suspension of luminous bacteria in a nutrient fluid. The ends of the tube were sealed shut, with enough spare space to accommodate a good-sized bubble of air.

When the tube was inverted, the bubble of course rose to the upper end, disturbing the bacteria and exciting them to luminescence.

Recently, as a "stunt," one of Prof. Molisch's students illuminated the great hall in the Paris Oceanographic Institute with a battery of "bacterial lamps." The light was faint, but sufficient to see by.

Over forty species of luminous bacteria are known to science, shining in all colors from deep green to bright yellow. Most of them are found on marine fish.

Science News Letter, July 27, 1935

EN FIELDS

ENTOMOLOGY

"Geometry" of Bees Is Not Result of Planning

See Front Cover

MATHEMATICAL powers are often ascribed to bees and wasps, in the making of the hexagonal cells of their wax and paper combs. This is a very pretty example of the more naive kind of nature study, but it must be dismissed (however regrettably) as just imagination. Bees and wasps are not architects or even geometricians; their "hexagons" are really squeezed cylinders.

Not often tightly squeezed cylinders at that, as you will see if you inspect a natural honeycomb, or a hornets' nest such as Cornelia Clarke has photographed for the cover of this issue of the SCIENCE NEWS LETTER. Most of the actual cavity openings are approximate circles, inscribed within a hexagon. A little closer inspection will show that the cells are built separately, each as a cylinder, and that they are partly cemented together by looser wefts of tissue between the walls.

A very simple experiment will show how little "planning" is needed to set up an apparent hexagonal structure. Get a few dozen empty tin cans of the same size, or cylindrical cardboard cartons, stack them up loosely on their sides in some kind of a tray, and shake them a little. They will inevitably settle into a hexagonal arrangement. If you put pressure on the pile, the cylinders will become hexagonal prisms. But even in their unsqueezed condition, you will be seeing hexagons in that pile of circles. A honeycomb, then, is partly the effect of simple physical pressure of cell on cell, partly not even that but just optical illusion.

Science News Letter, July 27, 1935

FORESTRY

Airplane Sown Seeds Grow Trees in Untrodden Area

TREES that sprang up from seeds scattered by airplanes are growing today in mountain fastnesses where man has never trodden, according to the reports of Hawaiian foresters. Because some areas in the precipitous volcanic mountains are inaccessible for planting by the usual means, the idea of sowing seeds from airplanes, borrowed from the United States Army, was hit upon.

At the time they were first scattered, it was impossible to determine whether any of the seeds took root, since the area sown could not be reached on foot. Today, however, foresters report that the trees are visible from a distance, particularly such varieties as the African tulips with their vivid scarlet flowers.

This method has been particularly useful in replanting areas on the island of Hawaii devasted by forest fires. According to a report of George McEldowney, forest supervisor for the Hawaiian Sugar Planters' Association on the island of Oahu, trees of the African tulip, Moreton fig, and hutu have been found in the mountains behind Honolulu, growing from plane-scattered seeds.

Dr. H. L. Lyon, a forester of the H. S.P.A., about ten years ago originated the idea of using surplus seed in such a manner. He made several experimental flights in the Maitland-Hagenberger plane "Bird of Paradise," first to fly from the continent to Hawaii.

Science News Letter, July 27, 1935

MEDICINE

Links Hay Fever Treatment With Immunity to Colds

A CURIOUS and still-unexplained relation between hay fever and the common cold which may provide a new method of attack on the latter disease is announced (*New York State Journal of Medicine*, July 15).

Dr. Louis Sternberg of Beth Israel Hospital of New York City has just completed a six-year study of the subject and arrives at the following conclusion:

Sufferers from hay fever in the summer are more susceptible than other people to common colds in winter, BUT when hay fever victims are treated with pollen extract for the affliction they show a greater immunity to colds later on.

"The reason," states Dr. Sternberg, "for this apparent immunity to the infection known as the common cold is not now known. It is presented as a clinical fact that remains to be explained. That those suffering from hay fever or asthma are generally more subject to upper respiratory infections than other individuals is a well known fact, but few among the numerous publications on the 'common cold' have ever mentioned how these colds are influenced by pollen treatment in hay fever subjects."

Science News Letter, July 27, 1935

PHYSIOLOGY

Hormones May Prove to Be Useful to Dairy Industry

HORMONES, products of the ductless glands which are proving valuable aids in medicine, may also be useful in the dairy industry, it now appears. The milk secretion and udder growth of cows are stimulated by certain of these hormones, Dr. C. W. Turner of the Missouri Agricultural Experiment Station has concluded.

The hormones which stimulate the growth of the udder are secreted by the ovary. After these hormones have stimulated the growth of the mammary glands, a second hormone secreted by the pituitary, a tiny structure located at the base of the brain, stimulates the initiation of the secretion of milk.

So well have the various steps of development been learned, that it has been found possible in experimental animals to develop the various stages of growth and finally induce tne abundant secretion of normal milk.

Just as the discovery of the hormones, insulin and thyroxin has been found of great value for those whose bodies produce an insufficient amount of these hormones, so the discovery of the action of these hormones stimulating the udder may eventually be used in increasing the milk secretion of animals deficient in milk production, is the belief of Dr. Turner.

Science News Letter, July 27, 1935

MEDICINE

Indian Medicine Man Uses Rum for Anesthetic

SURGICAL procedure by an Indian medicine man in Brazil, surprisingly like that of white doctors in its essentials but with some curious differences in detail, is described by an Austrian scientist, Dr. J. W. Freise, recently returned to Vienna from an exploring trip in the South American jungles.

An Indian hunter was brought in with a broken leg. The medicine man first anesthetized him—with a huge quantity of home-made rum, made from sugarcane juice. Then he set the broken bone, swathing it in the fibers of a native plant. This wrapping he soaked with two kinds of oils, one of which hardened, stiffening the fibers into the equivalent of the surgical cast used in white man's medicine.

Finally the whole set-up was given a protecting covering of bark, and the injured man's friends carried him home.

Science News Letter, July 27, 1935

ASTRONOMY

Watch Venus and the Perseids

Beautiful Planet Reaches Maximum Brightness on August 2; Meteors Expected on August 11 or 12

By JAMES STOKLEY

SINCE the last day of June, Venus has been drawing between earth and sun, and setting sooner and sooner after the sun has dipped below the horizon. Because it appears only by reflected sunlight, the illuminated hemisphere of Venus has been turning away from us, and through a telescope it's now a crescent, like the moon a few days after new. At the end of June the planet was at the distance of the sun, 93,000,000 miles. On the first of August it has approached to 42,415,000 miles, and on the 31st of the month it will be only 27,499,000 miles away. On September 8 it will come between us and the sun, when it will be closest, a distance of only 26,428,000 miles, nearer than any other planet can ever approach. But this close visit does not do us much good, because Venus cannot be seen in the sun's glare. At very rare intervals it comes directly between the sun and earth and is seen while in transit across the solar disc. The last transit of Venus was in 1882, the next will be in 2004, but even then it will just be a black spot, and no detail can be seen on the planet.

Earth Bright to Venusians

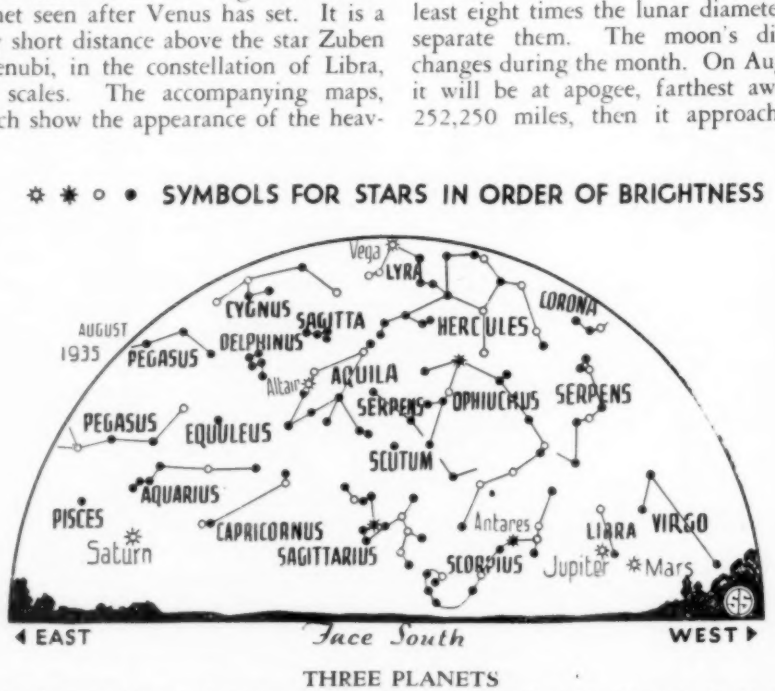
If there were any astronomers on Venus, however, and they could penetrate the layer of clouds that seem perpetually and completely to cover its surface, they would now have an excellent view of earth, better than we ever have of any other planet. To them earth would appear about six times as bright as Venus appears to us at the beginning of this month, when most brilliant. They would also see the moon, as bright as Jupiter to us, swinging every month to one and the other side of earth, so that the two would look like a double planet, the most striking object in the Venusian skies.

The accompanying diagram shows the way Venus changes its phase. Last winter, when beyond the sun, we could see its entire bright hemisphere, and it appeared as a complete circle, as shown in the first figure. On June 30 it looked as in the second, and as it had then come over 60,000,000 miles closer to us, it appeared much larger. Because it was increasing in size more rapidly than the bright half was turning away from us, it was waxing in brilliance. During July it became still brighter, and on August 2 will reach its maximum, when, through the telescope, it will appear as in the third figure. Towards the end of August, when closer yet, it will look like the fourth, but by that time the crescent will be so narrow that it will be much fainter than at the beginning of the month. Also, it will be so nearly in line with the sun that it will be out of view. By early October, however, it will have moved to the western side of the sun, when it will rise before the sun, as a morning star, and will go through the same changes in reverse order.

Though Venus disappears from view during August, still there will be three planets visible at once after dark, for Saturn has now appeared in the east, to take the place of his departing sister. Low in the southwest appear Jupiter and Mars close together, the former easily identified because it is the brightest star or planet seen after Venus has set. It is a very short distance above the star Zuben Elgenubi, in the constellation of Libra, the scales. The accompanying maps, which show the appearance of the heavens at 10:00 p. m., standard time, on the first, 9:00 p. m. on the fifteenth and 8:00 p. m. on the 31st, give the relative positions of these two planets at the middle of the month, when Mars is still to the west. On August 27 Mars, moving easterly through the sky, will pass directly south of Jupiter, about four and a half times the moon's diameter away from his brighter brother.

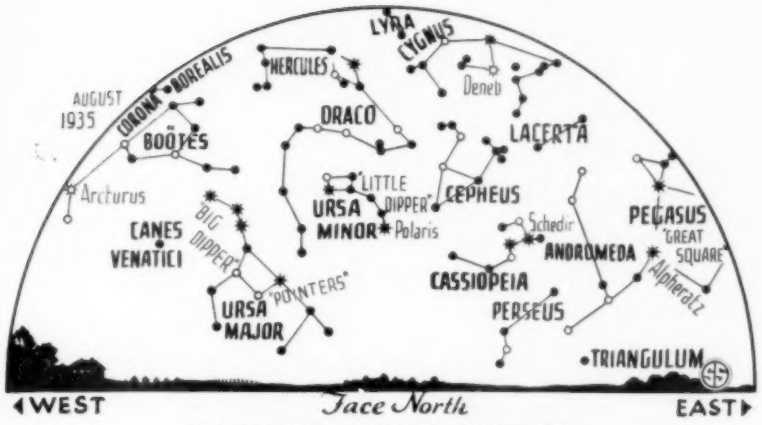
While Venus is so close to the earth, the other planets in the evening sky are much more distant. Mars has receded to 120,510,000 miles, on the 15th, while at that same time Jupiter will be 501,630,000 miles away and Saturn 814,080,000 miles. Mercury will be behind the sun on August 9, and not visible. Its distance will be 126,260,000 miles.

The moon and the planets move about the sky in similar paths, and once a month it passes each of them, making a striking sight when they are close together. During this month it passes Venus on the second, a little over three times its own diameter to the south and in a crescent phase, three and a half days past new. The two will be in conjunction when closest, at 7:41 p. m., eastern standard time. The moon passes Mars on the 6th, Jupiter on the 7th and Saturn on the 15th, but in each case a distance of at least eight times the lunar diameter will separate them. The moon's distance changes during the month. On August 2 it will be at apogee, farthest away, at 252,250 miles, then it approaches to



THREE PLANETS

Low in the west this month you may see bright Jupiter and ruddy Mars both shining in the single constellation of Libra, while in the southeast Saturn makes its appearance.



WHERE TO LOOK FOR METEORS

From the constellation of Perseus in the northeast just below the W-shaped Cassiopeia, the Perseid meteors appear to radiate, falling at the rate of nearly one a minute.

223,100 miles on the 15th, or perigee. On the 29th it will again be at apogee, 500 miles more distant than on the second.

The moon will be at first quarter on August 7 at 8:30 a. m., eastern standard time, will be full on August 14 at 7:44 a. m., at last quarter on August 20 at 10:17 p. m. and new again on August 28 at 8 p. m.

Libra, ordinarily a rather inconspicuous constellation, can be found easily this month, with two planets, Mars and Jupiter, in it. Ages ago, however, this was not a separate star group, but part of Scorpius, the scorpion, next-door to the east. In fact, the curious names of the two brightest stars in Libra recall this fact. In addition to Zuben Elgenubi, we have Zuben Eschemali, which are Arabic words meaning, respectively, the southern claw and the northern claw. Even though in Roman times the scorpion's claws were shortened to make another constellation, the old star names continue.

Easily Recognized

The scorpion itself is very easily recognized as he shines above the southern horizon on these August evenings. The curved row of stars to the right now represents his claws, and the hook-shaped line of stars to the left form the tail. Following him is Sagittarius, the archer, which resembles a tea-pot, the spout nearest the scorpion's tail. Next to the archer is Capricornus, the sea-goat, not very prominent, and he is followed by Aquarius, the water bearer, in which Saturn shines at about the same brilliance as Mars.

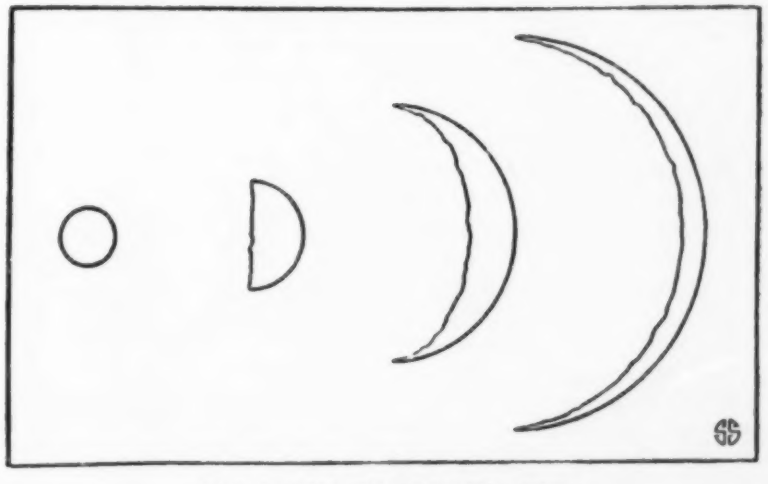
The brightest star now seen in the evening is Vega, in the lyre, Lyra, shining directly overhead. To the northeast is Cygnus, the swan, also called the northern cross, while to the southeast of Vega, Altair appears, in Aquila, the eagle. If you are away from city lights, you can see, running through this same part of the sky, the Milky Way. It is the broad pathway of light consisting of the combined illumination of myriads of stars in the same direction, each too distant to be seen separately. In the west is Boötes, with bright Arcturus, and near the horizon to the right of Mars is Spica, in Virgo, the virgin.

Just above Arcturus is the pretty little semicircle of stars forming Corona Borealis, the northern crown, which some of the American Indians pictured as a council of chiefs seated around a campfire. Hercules, the great strong man of mythology, can be seen between Corona and Lyra. To his south is Ophiuchus, the serpent carrier.

The great dipper, part of Ursa Major, the great bear, is in the northwest, while Cassiopeia, queen of Ethiopia, seated on her throne, is in the northeast. Directly east, resting on one corner, is the "great square of Pegasus," three of the stars of which are in this constellation, the winged horse. The fourth, to the left, is part of the neighboring constellation of Andromeda, the lady chained to the rock.

On any clear night of the year, if you watch the sky long enough, you will see a few shooting stars, or meteors, but at certain times they are much more numerous. One of these times of a meteor shower occurs this month, particularly August 11 and 12. More meteors can always be seen after midnight than before, so if one stays up rather late on these nights and watches the northeastern sky, he may be rewarded by seeing meteors at the rate of nearly one a minute. Unfortunately, the moon will be full on the 14th, and at the time of the shower will be in the sky most of the time. Its glare will hide the fainter meteors, but a great many should be seen despite it. If their paths are plotted, they will all seem to emerge from the constellation of Perseus, which is seen in the northeast about midnight, and for this reason the ones appearing in August are called the Perseid meteors.

The Perseids do not really radiate from this part of the sky, but are moving in a great swarm around the sun in parallel paths. Every August we cross this path, and as they enter the earth's atmosphere



VENUS HAS ITS PHASES, TOO

This diagram shows how the planet Venus changes its phases. Last winter, when farther away from the earth than is the sun, Venus appeared as a complete circle like the first figure on left. On June 30 Venus was 60,000,000 miles nearer the earth and appeared much larger, as does the second figure from left. On August 2 it reaches maximum brightness and appears through a telescope like the third figure. Toward the end of August it is even closer to the earth, but by that time its crescent is so narrow (fourth figure) that the planet is much fainter than it was at the beginning of the month.

and are arrested in their progress by friction with the air, they are heated, and disappear in a flash of light. The effect of radiating from one point is one of perspective. Their paths seem to converge in the distance like the parallel tracks of a railroad.

That the Perseid meteors are associated with Tuttle's comet, which was last seen in 1862, was the discovery of a distinguished Italian astronomer the centenary of whose birth was commemorated earlier this year. Giovanni Schiaparelli was born March 14, 1835, and died in Milan on July 4, 1910. In 1866 he showed that the path of the Perseid meteors corresponds exactly with that of Tuttle's comet, so there now seems no doubt that the meteors are the remains of the comet. Since that time the relation has also been shown for other comets and meteor showers. Schiaparelli is also known for his discovery of the peculiar straight markings on Mars, which he called "canali," meaning "channels," but which have always been mistranslated into English as "canals," thus implying an artificial origin, though this is seriously questioned. His name is well known today, though in a very different field from astronomy. His niece has achieved fame as a dress designer in Paris.

Science News Letter, July 27, 1935

PSYCHOLOGY

General Scientific Ability Believed Non-Existent

IS THERE a scientific type of mind?

Does the great chemist who studies the building matter of the world share with the astronomer who searches out nebulae beyond our galaxy some special talent setting them apart from their fellow men?

A British psychologist has weighed this problem and gives the encouraging answer "No."

"No child should be denied the right to receive a scientific education," declares Gordon A. Jahans (*Discovery*, June). "Every child is capable, within the limits of his general intelligence, of performing the mental processes involved in scientific thinking."

Intelligence Mr. Jahans likens to a boiler which gives energy to all the different sorts of mental activity that must be engaged in by the scientific man. But beyond this common source of power no "general scientific ability" exists to be shared by physicist and chemist, by botanist and physician.

Novel tests were prepared by Mr. Jahans to reveal an individual's ability to do scientific thinking. Mathematical ability and language ability, which are known or thought to be special talents, were left out of these tests by the expedient of using no words or number problems but only colored patches and forms of various sorts. Two of the problems were concerned with the classification of the forms according to given schemes.

In one set the task was comparable to that of the botanist who must sort out a group of leaves according to whether they are simple or compound, smooth-margined or toothed.

In the other set the task was more like that of the physician who must look for a certain set of signs or symptoms and note how many and which are present in a given set.

These tests were given to a number of children. After allowance had been made mathematically for their general intelligence, no relationship was found between ability on one of these tests and ability on the other.

The human mind evidently holds no special department equipped for the solution of scientific problems. If your son is a bright boy and he wants to be a scientist, the field is his.

That is the conclusion of Mr. Jahans. Another interpretation of his results seems possible, however. It may be that the great botanist achieves his distinction because he possesses individual qualities differing not only from the mental traits of the unscientific, but also from those of the physician and all other scientific men.

Perhaps every child does have a special "bent." If he has within him the making of a chemist, it may be that training could never make of him an astronomer great enough to equal his potentialities in his own field.

Science News Letter, July 27, 1935

The earliest astronomer, physicist, and clockmaker in the history of science, says Dr. J. H. Breasted of the Oriental Institute, was Amenemhet, who lived about 1550 B.C. in Egypt and left his autobiography on his tomb-chapel wall.

ENGINEERING

Clean Disposal of Waste Provided by Food Grinder

ELIMINATION of the garbage can, with its unpleasant accompaniments of flies, ants, odors and stray pieces of decaying food, is foreshadowed by the invention of an electrical device disposing of waste food by way of the kitchen sink.

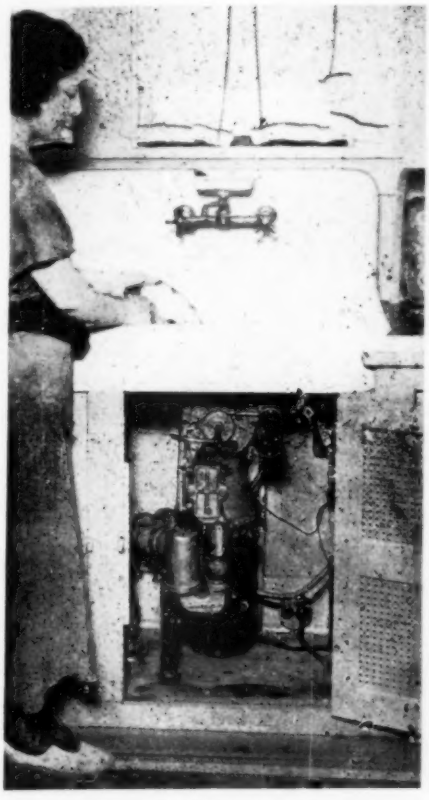
Driven by a small electric motor taking current from the house circuit, the device, developed by the General Electric Company, reduces waste foods to a fine pulp which washes down the drain into the sewer without clogging. Everything from watermelon rind to soup bones can be shredded and macerated, the only exceptions being bottles and tin cans. Tests trying out the device over the period of a year in a number of ordinary homes, including that of Morris Cohn, sanitation engineer of Schenectady, failed to discover any weaknesses. All kinds of food were handled with ease, and no drawbacks developed. The extra amount of water used in flushing was negligible, amounting to but one per cent. From the standpoint of use of electricity, the average cost of operation per month is about half that of an electric clock. Grease and oily substances coagulate and pass through the pipes without clogging or coating, it is claimed.

The grinding unit weighs about 75 pounds, and the grinding knives are made of carbolay, an alloy metal of extreme hardness. Operation is very simple, requiring not more than five minutes a day.

Disposal of garbage by grinding it and washing it down the drain is not quite as simple as it sounds, according to Public Health officials and sewage disposal experts in Washington. There would be no Federal or state objection to such a method, which has many advantages, but its success would depend upon two important local factors. The first is the ability of local sewer pipes to handle the added solid material without "sludging up" and second the capacity of the local sewage plant in regard to disposal of solid matter. In localities where the sewage is dumped into the river without treatment there might be problems caused by settling sediment in tripled amounts.

Providing these objections can be overcome, the consensus seems to be that the plan might have possibilities, although all stressed that it is entirely a local matter for consideration individually by each town or municipality.

Science News Letter, July 27, 1935



NEW CONVENIENCE

This food grinder, small enough to fit under the kitchen sink, will cut up all sorts of waste food into a mash fine enough to wash away down the waste pipes.

PHYSIOLOGY

Vitamin Is Old-Fashioned; New Names Should Be Used

VITAMIN is an old-fashioned word that has served its period of usefulness and should now be discarded, in the opinion of Andrew Moldavan, of Montreal.

"The vague expression 'vitamin' will eventually join the musty company of phlogistic, humors, animalcules and kindred antiquated terms," predicts Mr. Moldavan (*Science*, June 28).

Vitamin was all right in the early days of the discovery of the vitamins, explains Mr. Moldavan, but now that scientists know so much about the chemistry of the vitamins and their effect on the body, there is no further excuse for not calling them by more specific and accurate names. They should be classified, he suggests, with the chemical family to which they belong or grouped with the natural or pharmaceutical substances to which they are closely related in their effect on the body.

Science News Letter, July 27, 1935

MEDICINE

Animal Charcoal Successful As Treatment for Infections

Used on 150 Patients With 300 Injections Resulting In Quick Relief; Pain All Gone Within 48 Hours

SUCCESS in treating various infections by injecting animal charcoal into the veins has been reported to the Academy of Medicine, Paris, by Dr. Eugene St. Jacques of Montreal.

Dr. St. Jacques believes this is a very successful treatment for childbirth infections and also claims he has had remarkable success in the treatment of boils. Within forty-eight hours there was no pain, the boils soon healed and the cures seemed to be definite. Septicemias of the worst kind improved and were cured in a short time with the animal charcoal treatment.

He has used charcoal this way in one hundred and fifty patients, giving three hundred injections. There were no unpleasant results. The circulation was in no way affected. Only in a few cases did the temperatures rise slightly at the end of the first hour.

The preparation used was a two per cent. suspension of animal charcoal in distilled water. In using the suspension, the piston, the syringe barrel and needle were coated with sterilized paraffin to prevent the clinging of the particles of carbon and blocking the syringe.

Prof. R. I. Conklin of the Macdonald College at Ste. Anne de Bellevue, Quebec, had been making experiments on animals with this method. In the college they had treated seven hundred thirty-eight animals with various infections with good results. The findings from these experiments led Dr. St. Jacques to believe that the therapy would be equally efficacious when used on his patients. The biological findings showed that the endothelial cells of the spleen, liver and bone marrow became more active in clearing the offending infections. The polynuclear cells of the blood increased in number and become more vigorous in ingesting the bacterial agents.

The method used by Dr. St. Jacques is to inject from 3 to 5 cubic centimeters intravenously according to the seriousness of the infection. He thinks a larger dose would not be injurious.

Animal charcoal, when purified, is a dull black powder, tasteless, odorless and insoluble in water, alcohol or the solvents. It has great adsorptive properties and has been used for many years as an antidote for animal and vegetable poisons. At one time it was a favored constituent in bread and flaxseed poultices for use on infected wounds and ulcers. Dr. St. Jacques seems to be the first to have used this new method of injecting animal charcoal in a sufficient number of cases to prove definitely its value in refractory infections.

Science News Letter, July 27, 1935

ENGINEERING

Engineer Sees Wider Use of Precious Metals in Industry

GOLD, silver, platinum, and other precious metals deserve a much wider use in industrial operations than they now have, according to Frank E. Carter, of Baker and Company, Newark. Their use would solve many problems of corrosion, acid and heat resistance now the bane of engineers, he points out in a report to the American Institute of Chemical Engineers.

Iron, the most generally used metal, has good properties and is cheap, but in a great many industrial processes nonferrous metals are admittedly better and would be used except that they cost more. Sometimes the question of cost is too hurriedly considered, Mr. Carter points out. Longer life, improvement in product and high salvage price of precious metal parts would often over-balance the initial price difference. Under some conditions due to market fluctuation, the scrap value of

precious metal equipment has exceeded its original cost.

Already precious metal alloys have become practically indispensable to rayon manufacturers for the making of delicate spinnerets that make the silk-like threads. These alloys could be used in other processes of the industry where "exceeding purity of product and accuracy of dimensions are essential."

Among proposed uses for precious metals and their alloys is the increased employment of platinum,—non-tarnishable at any temperature—in the making of chemical equipment, and high temperature furnaces.

"The use of platinum in chemical equipment need not be confined to very minute parts; it is quite feasible to make large vessels, tubing, etc. of the precious metal," says Mr. Carter, adding that, "there should be a wide field in chemical engineering for platinum finish, which withstands acid attack so well."

A recently proposed plan of water sterilization would use large amounts of silver and thus be of great benefit to the silver-mining Western states. Strong alkali solutions do not attack silver, Mr. Carter emphasizes, and even the fused caustic alkalies have practically no effect on silver vessels. Silver also has possibilities in the preparation of very strong solders, which replace the "soft" solders based on lead.

Gold has already proved its worth to chemistry, and for certain chemical processes the complete apparatus is made of fine gold. To overcome the softness of such mechanisms, Mr. Carter suggests the addition of platinum.

The present percentage of platinum metals, used in industries follows: jewelry, 46 per cent.; dental, 25 per cent.; chemical, 14 per cent.; electrical, 9 per cent.; miscellaneous, 6 per cent.

Science News Letter, July 27, 1935

ARCHAEOLOGY

Finds Freak of Nature Awed Ancient People in Canyon

BECAUSE a freak of nature set a big sun symbol high on a canyon wall, Utah Indians, about 900 A.D., worshipped the sun there with altar rites and rattlesnake dances.

This discovery is announced by Dr. Albert B. Reagan, special professor of anthropology at Brigham Young University, following an archaeological expedition to Buckhorn Canyon, Utah.

"A sluffing-off of the rock face a hundred or more feet above the valley floor outlined a circular rayed space of probably 16 feet in diameter, just about facing the noon-day sun," stated Dr. Reagan.

Fremont peoples, as Dr. Reagan calls these Indians, "were attracted in ancient days by this freak-of-nature rayed circle, and often assembled to worship the sun, thus to them represented by it. Beneath it they camped till the ashes of that long-gone time are today a foot or more thick for a distance of 200 feet along the rock wall under it. That they had altars under it and also danced to it in the narrow valley, there seems no doubt; for on the canyon walls beneath it they drew dance and other religious scenes of obeisance to it."

The drawings, Prof. Reagan reported, are almost life-size and are in striking reds, browns, and yellows. The almost continuous series is 162 feet in length and more than twelve feet high. Fifty-one human beings are included in these representations.

"Among the figures depicted," he said, "are feathered lightning snakes, a turkey dancer showing a scene as now acted out by both the Hopi-Pueblos and the Utes, a scene like sand-painted medicine scenes now used by the Navajos, and men dancing with snakes, some of which are rattlers. A whorled-haired woman, of Hopi style, is shown. Men are dancing with winged hands, others with great streamers floating from the crowns of their heads, arms and shoulders. An eagle is flying over each of the two principal actors, while a line of llamas is shown above the other actors of the same group. The men of other groups have fleecy clouds represented as suspended from their outstretched arms in an imitation flying dance.

"The whole scene is so drawn as to show that the actors are doing obeisance to the freak-of-nature sun-disk on the rock wall above them, that they are adoring it. The drawings of the humans are all made by the Fremont pattern used by that people about 900 A.D., as found elsewhere in Utah."

Science News Letter, July 27, 1935

Hunters rarely see leopards because they rove chiefly at night.

ARCHAEOLOGY

Mayan Indian God Found With Mother-of-Pearl Eyes

A BURIED sanctuary of the ancient Mayas has yielded a prize statue of a god of painted body and eyes, teeth and nails of mother-of-pearl.

The discovery is reported by Mexican government archaeologists excavating in the Mayan Indian ruins of Chichen Itza, Yucatan. The sanctuary belongs to a shrine on top of a stone pyramid inside another pyramid.

When tunneling the outside structure, called the Castle by the Spaniards and the Temple of the Plumed Serpent by the Indians, the archaeologists found that it had a replica of itself inside. Like the outside pyramid, the inside one had a temple on top, and in this temple, stuffed with debris, was found the remarkable statue.

The statue is a deity in reclining pose whose likeness was first discovered by archaeologists in the nineteenth century. They called him Chacmool, Red Tiger, thinking they had found the statue of a Mayan prince so named. The Carnegie Institution of Washington discovered a Chacmool several years ago in a similar sanctuary buried in the warrior's pyramid at Chichen. But the present figure is the most interesting of all known. It still has colored stucco on it, and the mother-of-pearl incrustations are unique.

Science News Letter, July 27, 1935

GEOLOGY

Strife of Fire and Ice Created Crater Lake

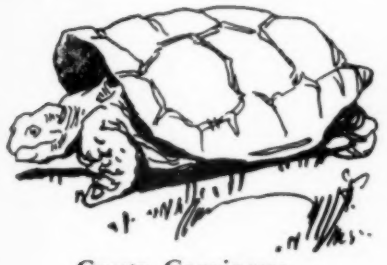
CRATER LAKE, in the national park of that name, was born of a long contest between fire and ice, with each alternately gaining the upper hand. So Dr. Wallace W. Atwood, Jr., of Clark University, has discovered in the course of geological investigations of this famous and beautiful lake-in-a-volcano. (*Journal of Geology, Feb.-March*, 1935). The rim surrounding the lake contains alternating layers of lava and glacial material.

The story is plain. When the dying volcano was dormant, for centuries at a time, glaciers would form on its slopes, leaving the rounded and ground-up rocks characteristic of glacier action. Then would come an eruption, destroying the glaciers and depositing lava on top of their layers of "till." Then the glaciers would return again, and the cycle would be repeated.

Science News Letter, July 27, 1935

EVOLUTION

NATURE RAMBLINGS
by Frank Thone



Crusty Convincers

ON WHAT incongruous steeds world-shaking ideas have sometimes come a-riding!

About a hundred years ago a young naturalist scrambled around among the rocks on the shores of the Galapagos Islands, south of Panama and west of Ecuador. He was having the time of his life, for almost every animal and plant he saw was a species new to him. Reflecting on the possible why and wherefore of this island life being so different from that of the nearby mainland, he was hit right between the eyes with a big idea.

Not being a precipitate young man, Charles Darwin went home and incubated this big idea for forty years before he let it loose in print, to startle the world and revolutionize biology and philosophy.

One of the first things that the young Darwin must have seen on the Galapagos Islands were their tortoises. He must have seen them very soon, for they are the biggest living things in sight there. The old ones—and nobody knows how old they are—get to have a shell diameter of half a dozen feet, and can carry full-grown men on their backs apparently without effort. They are really monumental reptiles.

There were giant tortoises practically without end when Darwin visited the islands. But there are relatively few of them now. Ecuador has never bothered itself about the conservation of wild life on these offshore possessions, and the ranks of the tortoises have been mercilessly decimated by reckless hunters and by whalers that wanted a big mess of turtle soup for their crews.

So the best chance that the Galapagos tortoises have is in emigration. A few zealous zoöphiles have carried off quite a number of them alive for zoological parks.

Science News Letter, July 27, 1935

ZOOLOGY

Museums Lack Specimens of Animals Now Becoming Extinct

"EXPLORATION, like charity, begins at home." That is the pertinent comment of Dr. Roy Chapman Andrews, director of the American Museum of Natural History. Dr. Andrews, who has headed expeditions into the farthest corners of the earth in search of rare animals for museum groups, realizes that it's high time to hunt for specimens nearer home.

Recent droughts, dust-storms, floods, and erosion, bringing many small rodents of the western prairies close to extinction, called attention to the astonishing fact that specimens of these and other native animals are entirely lacking in several cases. In the American Museum there is only one state—Connecticut—represented by a one-hundred per cent. collection of its animal life. There are no collections whatever in the Museum from the following states: Louisiana, Mississippi, Oklahoma, Alabama, Tennessee, Kentucky, Illinois, Ohio, Indiana, South Carolina, West Virginia, Pennsylvania, Maryland, Delaware and Rhode Island.

Sponsors of museum expeditions are usually interested in the fauna of far-away places, according to Dr. Harold E. Anthony, curator of mammals at the Museum, in explanation of the situation.

"We have now come to realize," he said, "that various forms of mammals in our country are in danger of extinction and have been going for some time. The great herds of antelope and bison which once roamed the plains have disappeared before the advance of civilization. Now the small burrowing rodents of the western states are being buried under drifts of dust, or drowned by floods."

Pre-historic horses and camels inhabiting the western part of America during fairly recent geological times, suddenly became extinct for reasons not entirely known to scientists, so that the horses brought over by the Spaniards under Cortez were the first that the Aztecs had ever seen, Dr. Anthony pointed out as a parallel case.

Plans have been made for obtaining a complete collection from every one of the states. Dr. Anthony hopes to secure a mobile laboratory with living quarters to travel through various parts of the United States, picking up specimens with the seasons. Meanwhile the Museum is already extending its North American mammal collection with the aid of a number of persons who have opened their ranches in the West to museum staff-members. Several expeditions have or will shortly set out to collect deer, elk, bear, and small animals.

Science News Letter, July 27, 1935

The earth would look blue if seen from outer space, says Dr. V. M. Slipher of the Lowell Observatory.

RADIO

Tuesday, July 30, 3:30 p. m., E.S.T.

HEALTH HINTS FOR HOT WEATHER, by Dr. Robert Olesen, U. S. Public Health Service.

Tuesday, August 6, 3:30 p. m., E.S.T.

THE PROGRESS OF MEDICINE, by Dr. Elliott C. Cutler, Professor of Surgery, Harvard University Medical School.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

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•First Glances at New Books

History

AFTER CORONADO—Alfred B. Thomas—*Univ. of Oklahoma*, 307 p., $3.50. The story of the almost forgotten Spanish pioneers who discovered mountains, rivers, and scenic wonders in Colorado, Utah and Arizona, and who colonized Texas, New Mexico, and California is told here, as the result of an intensive study of Spain's last 280 years in North America. Writers have had a tendency to bridge lightly the two and a half century gap between Coronado and Pike. Mr. Thomas has had access to much unpublished material to aid him in writing this chapter of American history.

Science News Letter, July 27, 1935

Library Science

TRAVEL THROUGH PICTURES; REFERENCES TO PICTURES, IN BOOKS AND PERIODICALS, OF INTERESTING SITES ALL OVER THE WORLD—Jessie Croft Ellis—*Faxon*, 699 p., $6. Compiled as a companion volume to *Nature Index* and *General Index to Illustrations*. Arranged alphabetically by country, and cross-indexed to facilitate easy use, this volume lists picture references to towns, mountains, rivers, lakes and the most outstanding sites of interest in the towns.

Science News Letter, July 27, 1935

Child Study

PARENT AND CHILD—Edgar Schmiedeler and M. Rosa McDonough—*Appleton-Century*, 301 p., $2.25. A book on child training for parents, teachers and pastors, written from the point of view of those of the Catholic faith.

Science News Letter, July 27, 1935

Science Teaching

AN EXPERIMENTAL APPLICATION OF A PHILOSOPHY OF SCIENCE TEACHING IN AN ELEMENTARY SCHOOL—George W. Haupt—*Teachers College, Columbia University*, 109 p., $1.50. What is, or should be, the purpose of science teaching in the elementary schools? What scientific facts are the very young capable of understanding and learning? What concepts are essential to the learning of certain facts? Light on these and many other pertinent questions are contributed by this study.

Science News Letter, July 27, 1935

Sociology

THE SOCIAL WORKER IN THE PREVENTION AND TREATMENT OF DELINQUENCY—Margaretta Williamson—*Columbia University Press*, 236 p., $2.50. The fourth in a series of job analyses, detailing duties and responsibilities, relationships, qualifications and working conditions as these were brought out by interviews with social workers.

Science News Letter, July 27, 1935

Education

AN EXPERIMENTAL READING STUDY IN THE JOINT LIBRARY-ADULT ELEMENTARY EDUCATION FIELD — Elizabeth C. Morriss, Marion V. Morse and Edna Phillips — *Teachers College, Columbia Univ.*, 44 p., 50c.

Science News Letter, July 27, 1935

Education

TEACHING SPEECH IN SECONDARY SCHOOLS — Letitia Raubicheck — *Prentice-Hall*, 309 p., $2. A textbook by the director of speech improvement in the New York City schools.

Science News Letter, July 27, 1935

Sociology

DIRECTORY OF SOCIAL AGENCIES OF THE CITY OF NEW YORK—Ed. by Jessica H. Barr—*Pub. for The Welfare Council of New York City by Columbia University Press*, 512 p., $3.00. Listing primarily welfare and health agencies. The mere alphabetic listing occupies 150 pages. Also included are a sectional list, an index to types of service, and a personnel index.

Science News Letter, July 27, 1935

Sociology—General Science

WHITHER PUBLIC RELATIONS WORK? —William A. Hamer—*Mellon Institute of Industrial Research*, 24 p., Free to specialists. Examining the development and sociologic aspects of public relations technics, this pamphlet makes a plea for the development of sociology as a science so that it can control the conduct of management and publicity work on a rational basis.

Science News Letter, July 27, 1935

Marine Biology

SCIENTIFIC RESULTS OF THE WORLD CRUISE OF THE YACHT "ALVA," 1931, WILLIAM K. VANDERBILT, COMMANDING: Bulletin of the Vanderbilt Marine Museum, Vol. V—Crustacea: Stomatopoda and Brachyura—Lee Boone—*Priv. print., Huntington, L. I., New York*, 210 p., 109 plates, $5.

Science News Letter, July 27, 1935

Archaeology

A FOLSOM COMPLEX: PRELIMINARY REPORT ON INVESTIGATIONS AT THE LINDENMEIER SITE IN NORTHERN COLORADO — Frank H. H. Roberts, Jr. — *Smithsonian Institution*, 35 p., 16 plates, 30c. Describes the first discoveries that show a variety of tools used by Folsom Man, and one of his camping grounds where he ate and worked.

Science News Letter, July 27, 1935

Engineering

SIX WAYS TO FIGURE RADIATION—Ed. by Harold L. Alt—*Domestic Eng. Co.*, 64 p., $2. Compact handbook for heating engineers.

Science News Letter, July 27, 1935

Engineering

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS GUIDE, 1935 —*The Society*, 1019 p., $5.00

Science News Letter, July 27, 1935

Psychology

OUR INVISIBLE SELVES — Florence Evans—*Richard G. Badger*, 113 p., $2. Written by the director of the Boston School of Public Speaking and intended as an inspiration and guide for those who wish to convert mere human capacity into ability.

Science News Letter, July 27, 1935

Sociology

WOMEN IN EIGHTEENTH CENTURY AMERICA—Mary Sumner Benson—*Columbia University Press*, 343 p., $4. This comprehensive account of the status of women, shows the long tug-of-war between liberal and conservative thinkers on the questions of feminine abilities and duties. The author has provided numerous footnote references to the historic material cited, and a bibliography of works dealing with women in this period, even as they were mentioned in famous sermons, travelers' letters, and novels.

Science News Letter, July 27, 1935

Astronomy

SEEING STARS—W. B. White—*Harter Pub. Co.*, 61 p., 10c. Available at 10-cent stores; not for sale through Science Service. Guide to the sky at night with good diagrams of the constellations.

Science News Letter, July 27, 1935

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